

Worksheet to Identify Potential Indicators for Ecological Monitoring

You return to visit your park in 20 years and walk through the park with the current resource manager. The manager tells you about the current condition of the natural resources, the management issues, and threats of the day. What would that person describe to you?

Exotic plants, including invasion by new species. Health of riparian corridor, specifically cottonwoods and willows, perhaps due to altered hydrographs although possible residual tordon. Water quality and quantity of Belle Fourche will still be an issue. Air quality will be an issue due to western energy development. Increased visitation, noise, overflights (although not real likely) such as private flights. Potential development along south border; park is surrounded by private property. Impacts to the tower from climbing.

What are the park's most significant natural resources (e.g., the river and its tributaries, caves and cave fauna, rare plant communities, elk herd)?

The tower, prairie dogs, raptors specifically prairie falcon, forest, river, they are actively maintaining meadows for natural patchiness, riparian area, have 3 springs, CCC structure, slot canyon on western side of park

What does your park contribute to regional biological diversity (e.g., what natural resources are preserved and protected at your park that are altered or threatened throughout the rest of the region)?

Tower due to falcon nesting, may be snake hibernacula, goshawk nest, significant turkey vulture roosting, prairie dogs, late seral stage or tall grasses versus neighbors who grazing, a lot of porcupines, yellow-bellied marmot

What park-specific legislative mandates direct the park to monitor a particular natural resource at your park.

Need to conserve buffer zone around the tower, especially in regards to erosion and the Belle Fourche. Nothing specific about monitoring.

What federally- or state-listed threatened and endangered species are known to occur in the park?

Bald eagle passes through and is here in the winter in the cottonwoods. Prairie dog is a candidate species. (Look into pine snake.) Peregrines have been here. Whoopers fly over the air space. Seven rare "state-listed" plants all on the edge of the range. Perhaps goshawk.

What is that status of your park's management plans?

Completed a GMP in 2002. 1998 RMP. Climbing Management Plan from 1995 expired in 2000. Have interim exotic plant plan. Fire Plan should be completed this year. Comprehensive Interpretive Plan. (download some from park's web page)

What is currently being monitored at or near the park by NPS or other entities (e.g., plants by fire effects program, plants by LTEM, exotic plants by exotic plant teams, birds by Breeding Bird Survey, butterflies, stream by USGS, Christmas bird count, weather data, NRCS photography, visitors by park staff, state roadside counts --- use the checklist below)?

Air: No. Would like one. Park is class II.

Amphibian: No other than incidental observations.

Birds: Ditto other than prairie falcon monitoring.

Fire: Fire Effects monitoring.

Fish: No.

Geology: No.

Mammals: Prairie dogs – density count using above ground observations and map perimeter.

Meteorology: Yes, NOAA (rain and temp) and RAWS.

Pests: Traps for gypsy moths by Forest Service.

Pesticides: EPMT and park tracks what they use. Would like data on tordon.

Reptiles: No other than incidental observations.

Soils: Tower top monitoring. Study done 10 years ago that can be replicated. Looked at vegetation composition and structure.

Sound: Sound measurements collected for an entire year around 1996 by James Foch. FAA subcontracted for monitoring sound as a baseline prior to airport's opening. Will duplicate one year after opening airport.

Vegetation: EPMT and in park efforts exotic plant efforts. Shauna Woods from MSU. Fire Effects monitoring. They have deer exclosures. Previous work on tower.

Visitors: Entrance information. Climbers. Visitors in center. Annual visitor survey. No record on the hiking trails. Park does annual assessment of trails FMSS (facilities management software system).

Visual Landscape: No set photo points (some photos for exotic plants). Do have a viewshed analysis in GIS.

Water Quality: No stations maintained by the park. State may collect some data near the park. Park tests potable water tested for nitrates and nitrites. Some wells (about 12) in park where data is collected monthly by the park on water table levels; objectives are unclear; been done for decades.

Wildlife or Plant Disease: Non-systematic watching of prairie dog colony, West Nile, CWD, EHD/bluetongue. Park does submit samples as needed.

What are the stressors on park resources?

Climbing, prairie dog conflicts with other park objectives, exotic plants, ranching activities, dam, energy development, herbicides, visitors, development from GMP, airport, development outside park boundary, livestock trespass, current park infrastructure (housing, roads), motorcycles, .

What are some monitoring questions relating to current internal natural resource management actions or external threats (e.g., is the prescribed fire regime maintaining healthy native prairie?)?

Is climbing effecting integrity of the tower (e.g., things falling off, loss of soil at top and base, exotic plants, impacts from bolts and hangers, audio impacts).

What potential management actions in the future may require monitoring (e.g., potential species reintroductions, land acquisitions, commercial uses)?

Potential acquisition (maybe on south). Changes in transportation as described in GMP

What would your partners like you to monitor?

CWD, West Nile, Exotics, Fire Effects to defend program (why burn instead of cut).

What current research is occurring at the park (research differs from monitoring in that it is typically of shorter duration, say 2-3 years)?

*Effects of herbicides by Summer Alger – Terry Cacek would know and park has copy.
Dating of tower.*

Vital signs are: 1) sensitive enough to provide early warning of change, 2) have low natural variability, 3) can be accurately and precisely measured, 4) have costs and effort of measurement that are not prohibitive, 5) have monitoring results that can be interpreted and explained, 6) are low impact to measure, and 7) have measurable results that can be replicated with various personnel. Off the top of your head, look into your crystal ball and choose several vital signs to monitor over time to track the condition of natural resources within your park (items can range from broad, e.g., the stream, to narrow, e.g., a particular species). What are those vital signs? Rank them in order of importance.

Highest

Prairie dog density and area.

Monitoring of exotic plant species.

Air quality.

Riparian forest and shrub layer

Prairie falcon nesting.

Viewscape

Surrounding land use

Migratory birds.

Butteflies.

River geomorphology

Sensitive herps like leopard frog, perhaps in regard to pesticide use.

Lowest

(Jim is working with Mike Sweat to develop water quality proposal).

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The following was forwarded by Jim Cheatham to Dan Licht at a later date:

Below is a follow-up from our vital signs meeting for DETO T&E species. The two state listed species are as listed by the Wyoming Natural Diversity Database.

Park	Confirmed	Taxa Group	Taxa	accepted scientific name	Common Name
DETO	Yes	Animal	BIRDS	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE
DETO	Yes	Animal	BIRDS	ACCIPITER GENTILIS	NORTHERN GOSHAWK
DETO	Yes	Animal	MAMMALS	CYNOMYS LUDOVICIANUS	BLACK-TAILED PRAIRIE DOG

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